



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,893	08/04/2003	Miodrag Cekic	866.40842PX1	2897
20457	7590	12/13/2005		
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			EXAMINER JOHNSTON, PHILLIP A	
			ART UNIT 2881	PAPER NUMBER

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/632,893	Applicant(s) CEKIC ET AL.	
	Examiner Phillip A. Johnston	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-79 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-79 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

1. This Office Action is submitted in response to amendment dated 9-22-2005, wherein claims 1-79 are pending.

2. The Obviousness type Double Patenting Rejection of the previous Office Action is hereby withdrawn, having received and approved a proper Terminal Disclaimer.

Claims Rejection – 35 U.S.C. 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

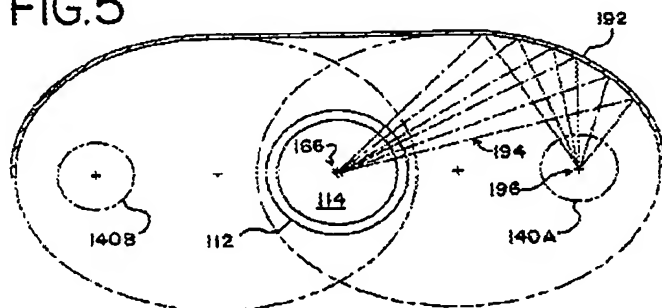
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 11-22,27-29,35,40-42, and 69-79 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Pub. No. 6,590,217, to Freeman, and Carter, U.S. Patent No. 6,626,561.

Freeman (217) discloses a UV sterilization unit having a tubular shaped irradiation chamber formed of plural reflectors 192 and plural tubular shaped lamps 140A and 140B, aligned longitudinally such that all UV energy is focused on the fluid in

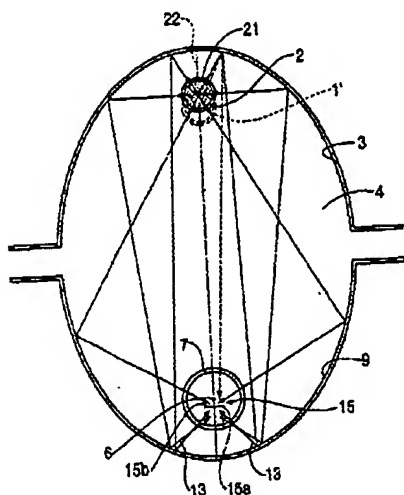
passageway 112, as recited in claims 1-4,11-17,19,20,27,72, and 74-79. See Column 2, line 65-67; Column 3, line 1-14; Column 6, line 15-27; and Figure 5 below.

FIG. 5



Freeman (217) as applied above fails to teach placing the lamp in a position spaced apart from the focal axes of the troughs to provide a uniform irradiation distribution, as recited in claims 1,18,21,22,28,29,69-71, and 73. However, Carter (561) teaches defocusing the lamp within the reflector chamber to provide more uniformity of irradiation at the surface of the sample. See Column 3, line 3-9; Column 4, line 11-20; and Figure 4 below.

FIG. 4

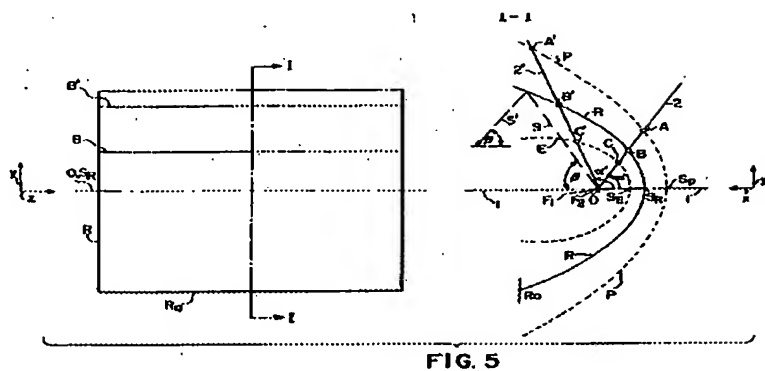


Therefore it would have been obvious to one of ordinary skill in the art that the UV sterilization apparatus and method of Freeman (217) can be modified to use the source defocusing method of Carter (561), to provide a lamp spaced from the first focal point of the elliptical reflector, thereby providing a more uniformly irradiated sample surface.

5. Claims 5-10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Freeman (217) and Carter (561), in view of Kano, U.S. Patent No. 5,136,491, and in further view of LeBlanc (387).

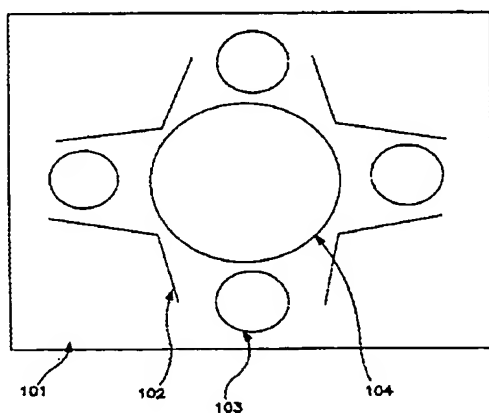
The combination of Freeman (217) and Carter (561) fails to teach the use of the reflector shapes recited in claims 5-7, and 10. However, Kano (491) discloses the use of elliptical, parabolic and segmented reflector shapes, as recited in claims 5-7, and 10. See Column 1, line 10-16; Column 6, line 1-14; and Figure 5 below.

Therefore it would have been obvious to one of ordinary skill in the art that the UV sterilization apparatus and method of Freeman (217), and Carter (561), can be modified to use the reflector shaping method of Kano (491), to provide various reflector forms, but also providing the lamp designer with a method enabling him to design an optimum reflector form in dependence upon the given marginal conditions for the lamp and the desired light distribution.



The combination of Freeman (217), Carter (561), and Kano (491) fails to teach the use of a V shaped reflector, as recited in claims 8 and 9. However LeBlanc (387) teaches the use of a V shaped reflector. See Figure 1 below.

Therefore it would have been obvious to one of ordinary skill in the art that the sterilization apparatus and method of Freeman (217), Carter (561), and Kano (491) can be modified to use the V shaped reflector of LeBlanc (387), to provide fluid exposure to the radiation that can be optimized by creating an orientation pattern of UV lamps around the tubing with ultraviolet reflective surfaces directing the radiation toward the fluid.



6. Claims 23-26,30-34,36-39, 43-68,71 and 72 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Freeman (217), Carter (561), Kano (491), and LeBlanc (387).

Regarding claims 23-26,30-34,36-39, 43-50,71 and 72, the combination of Freeman (217), Carter (561), Kano (491), and LeBlanc (387) discloses the claimed invention except for the rearrangement of sources and the fluid passageway, relative to the focal axes of the troughs as recited in claims 23-26,30-34,36-39, 43-50,71 and 72. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to rearrange the locations of the sources and the fluid passageway within the irradiation chamber, since it have been held that a mere rearrangement of element without modification of the operation of the device involves only routine skill in the art. One would have been motivated to rearrange the locations of the sources and the fluid passageway relative to the focal axes of the troughs for the purpose of optimizing irradiation of the sample.

In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950), shifting the location of an element would not have modified the operation of device. In re Kuhle, 526 F.2d 553, 188 USPQ7 (CCPA 1975), the particular placement of an element was held to be obvious.

In addition, the Figures disclosed in the references below are further evidence that one skilled in the art would be motivated to rearrange the locations of sources and samples in an irradiation apparatus to optimize the intensity distribution in the sample;

Figure 2b in U.S. Patent No. 6, 083,387;

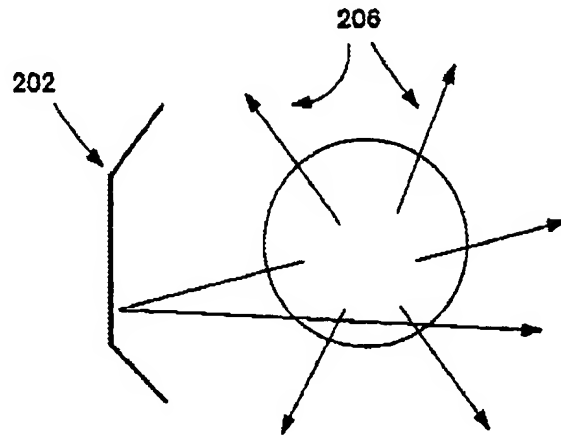


FIG. 2B

Figure's 1 and 4 in U.S. Patent No. 5,989,283;

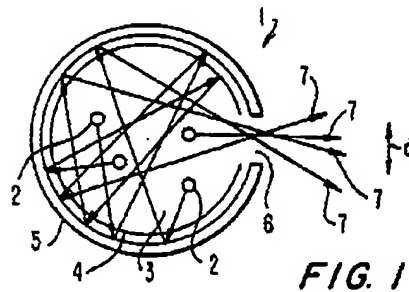


FIG. 1

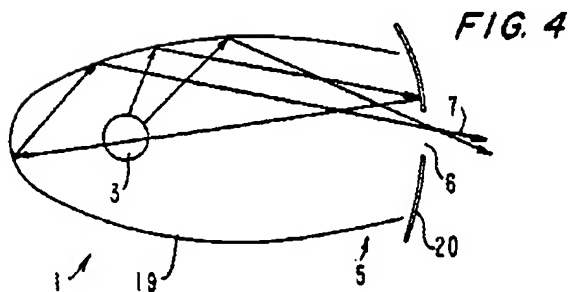


FIG. 4

Figure's 4 and 5 in U.S. Patent No. 4,694,179;

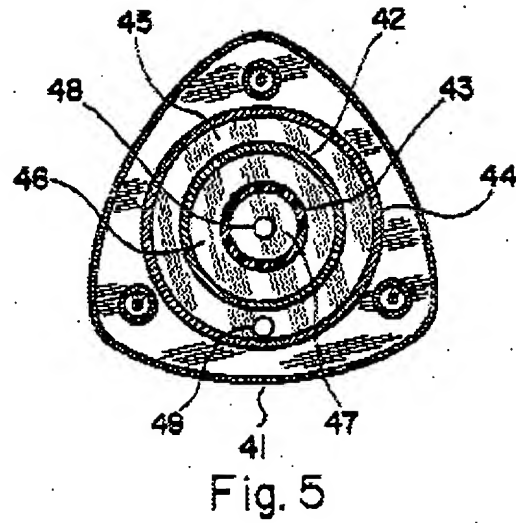
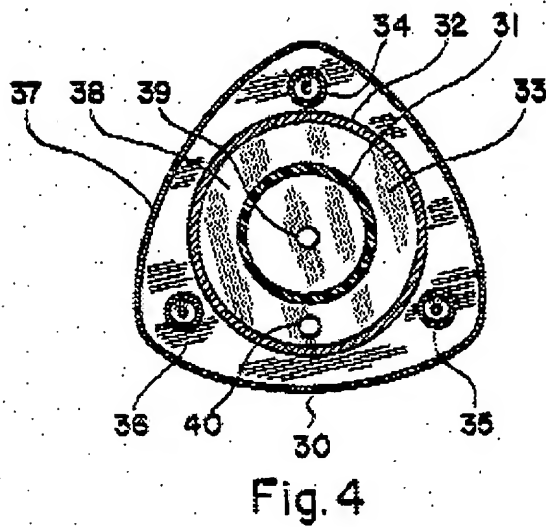
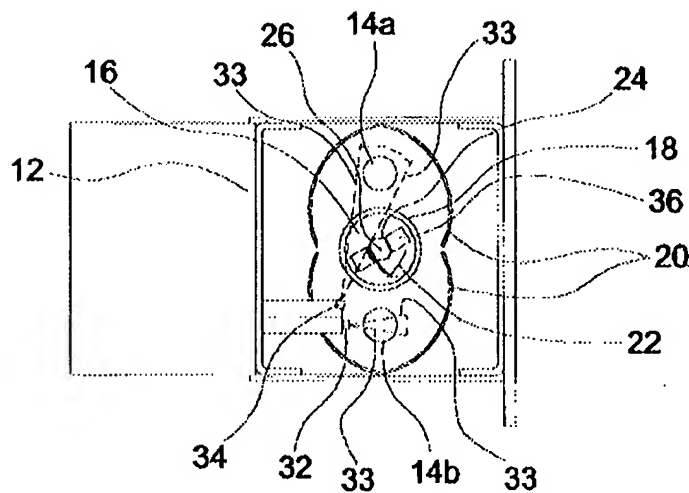


Figure 3 in U.S. Patent No. 6,707,048



Regarding claims 50-68, the combination of Freeman (217), Carter (561), Kano (491), and LeBlanc (387) discloses the claimed invention except for the source mount, trough mount and fluid passageway being adjustable. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make adjustable, since it have been held that adjustability, where needed, involves only routine skill in the art. One would have been motivated to make the source mount, trough mount and fluid passageway adjustable for the purpose of changing the their respective positions to optimize the irradiation.

In re Stevens, 212 F.2d 197, 101 USPQ 284 (CCPA 1954), the court held that adjustability, where needed, is not a patentable advance, and because there was an art recognized need for the adjustment.

Examiners Response to Arguments

7. Applicant's arguments filed 9-22-2005 have been fully considered but they are not persuasive.

Argument 1

Applicant states that "The Examiner's reliance upon Carter to motivate a person of ordinal skill in the art to modify the teachings of Freeman et. al., which rely upon focusing of light from the sources 140A and 140B into the center of the fluid chamber, to produce the claimed uniform irradiation of the flowing fluid is misplaced. Carter et al.

pertain to increased uniformity of irradiation of both near and far surfaces of work pieces as set forth in Column 5, lines 51-67 and elsewhere. As may be seen, either a moving ribbon 15 as illustrated, for example, in Fig. 4 or a continuous filament at 30' as illustrated in Fig. 9, are treated to provide a uniform surface irradiation. However, a person of ordinary skill in the art would not consider a teaching of uniform surface radiation " to provide a substantially uniform irradiation within the fluid in said fluid passageway" as recited in claim 1. Clearly, the consideration of achieving uniform surface irradiation for surface curing purposes is fundamentally different than the substantially uniform irradiation of a flowing fluid inside of a conduit to achieve uniform irradiation therein, which is subject to the problems described in the specification. While the teaching of Carter et al. is to move the irradiation source 21 away from a focal point to achieve the objective of uniformly irradiating the surface of the work piece being treated, such teaching is not analogous art. A person of ordinary skill in the art would not be motivated to modify the focusing of irradiation into a fluid flowing through a passageway as taught by Freeman et al. to not focus the radiation such that a substantially uniform irradiation distribution within the fluid in the fluid passageway is achieved as recited in claim 1 such that there are not substantially different degrees of irradiation being imaged upon the flowing fluid depending upon the position of the flowing within the passageway."

The applicant is respectfully directed to claims 21 and 69 in applicants published application No. 20040021090, which read;

Claim 21. Apparatus according to claim 1, wherein said fluid passageway and said at least one source of irradiation are positioned so as to provide a substantially two-dimensionally uniform irradiation distribution across a cross-sectional plane of the fluid flowing in said fluid passageway.

Claim 69. A method of providing a substantially two-dimensionally uniform irradiation distribution across a cross-sectional plane of a fluid flowing in a fluid passageway, said method comprising: providing the apparatus according to claim 1; positioning at least one of (a) said fluid passageway and (b) said at least one source of irradiation such that defocused irradiation from said at least one source of irradiation irradiates the fluid in said fluid passageway with a substantially two-dimensionally uniform irradiation distribution; and activating said at least one source of irradiation.

The applicant is also respectfully directed to Carter (561), Column 2, line 29-41, which states; In addition, focusing of light rays 12 at second focal point 6 can cause problems in uniformity when, for example, the fiber or fibers being treated are not solely at second focal point 6. For example, where a ribbon is being processed which has a planar surface having a width perpendicular to the direction of motion of the ribbon (that is, in a width direction of elliptical space 4 shown in FIG. 1), focusing of light rays 12 at second focal point 6 causes non-uniformity of light irradiating on the ribbon. Such non-uniformity is especially disadvantageously great for light irradiating the surface of the ribbon facing bulb a compared with light irradiating the surface of the ribbon facing away from bulb 1.

The applicant is further respectfully directed to Carter (561); Column 7, line 10-35, which states; Also shown in end reflector 32 in FIG. 8 are two holes 33, 35 provided in end reflector 32. Hole 33 is provided at the first focal point, and hole 35 is provided displaced therefrom. According to the present invention, the bulb can be supported by hole 35, for positioning the bulb with its center displaced from first focal point 2. Thus, in being supported by hole 35, the bulb is located a little closer to the back of reflector 3, which provides a little more energy coupled to the bulb than when the bulb is at the conventional position (that is, supported by hole 33). With use of the end reflector and location of the bulb a little closer to that of the reflector, irradiance at focus is reduced, but is increased in the far field. This is an improvement to the "depth of field" (a term for the ratio of energy getting to the near surface versus a farther surface). Thus, the present structure provides non-focused energy in the near-field (surface of the fiber or ribbon closest to the bulb) and enhanced irradiation (illumination) in the far-field, to improve uniformity and improve effectiveness of the lamps. Through displacement of the bulb, especially together with the use of the end reflector, mid- to far-field irradiation and dose for three-dimension curing is improved, overcoming one of the fundamental problems in three-dimensional curing when using tubular lamps, which exhibits a serious fall-off of energy in the far-field (that is, far side of the fiber or ribbon relative to the bulb).

The examiner has interpreted from the applicant's claims above and the Carter (561) references above, that adjusting the position of the source away from the focal point of the reflector is performed by both the applicant and Carter (561) to obtain the

same result; i.e., to provide a uniform irradiation distribution of the sample, which is governed by the same fundamental principle of optics, "depth of field". In fact, Carter (561) uses defocusing to eliminate the disadvantages produced by non-uniformity of irradiation at the sample surface. Thus the teaching of Carter (561) is applicable to providing uniformity of irradiation for any material passing through the sample passageway (quartz tube 7), solid or liquid, and is therefore analogous art.

In addition, one of ordinary skill in the art of irradiation chambers having primary and secondary elliptical shaped reflectors as used by Freeman (217) would be motivated to utilize the Carter (561) invention to overcome non-uniformity of irradiation at the sample, which according to Carter (561) is a fundamental problem associated with their use.

Conclusion

8. The Amendment filed on 9-22-2005 under 37 CFR 1.131 has been considered but is ineffective to overcome the Freeman (217) and Carter (561) references, in the rejection above.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

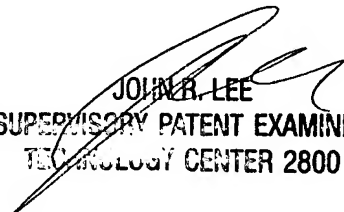
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 6:30 am to 3:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ
December 7, 2005


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800